

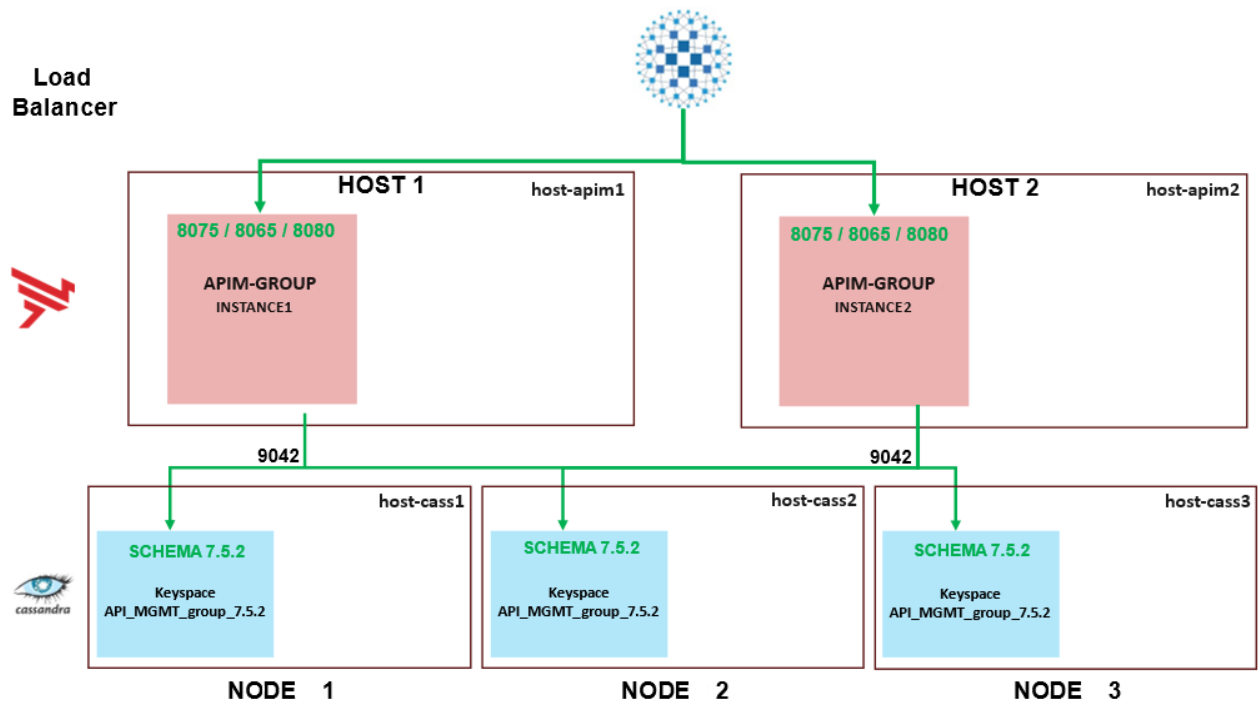
# Introduction

The objective of this Cassandra schema upgrade procedure is to replace the schema of an obsolete Keyspace generated with v7.5.2 or before to a schema compatible with the current version supporting Cassandra v3 and v4.

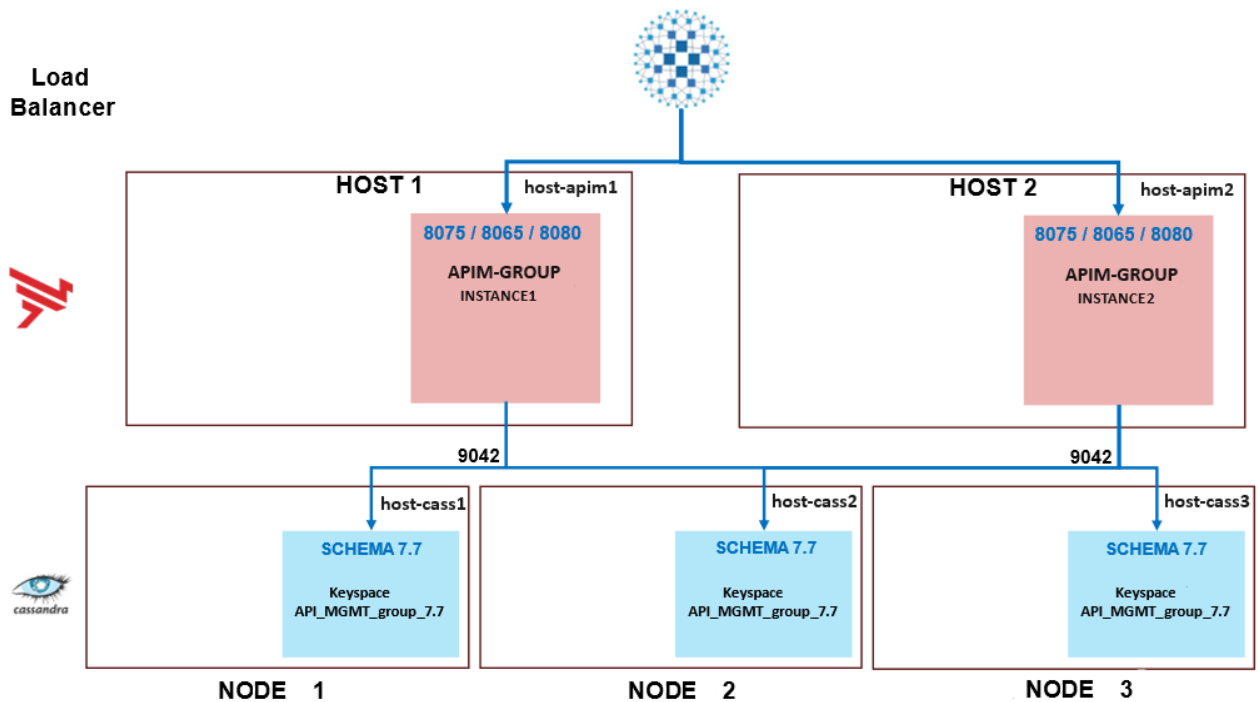
## 1. PREREQUISITES.

- Suspension of any updates to API Manager config for the duration of the procedure: i.e. Backend APIs / Frontend APIs / Applications / Users / Organisations.
- API Gateway version patches up to date.
- Version 2.7 of python installed on one of the Cassandra nodes to run cqlsh interpreter.
- Opening for the duration of the operation of port 7075 (or any other port number).
- Keyspace name is the default x\${DOMAINID}\_\_\${GROUPID}
- Note if using system services, systemd config may use hard coded paths that will need changing to the new group-instance.

## 2. Initial topology.



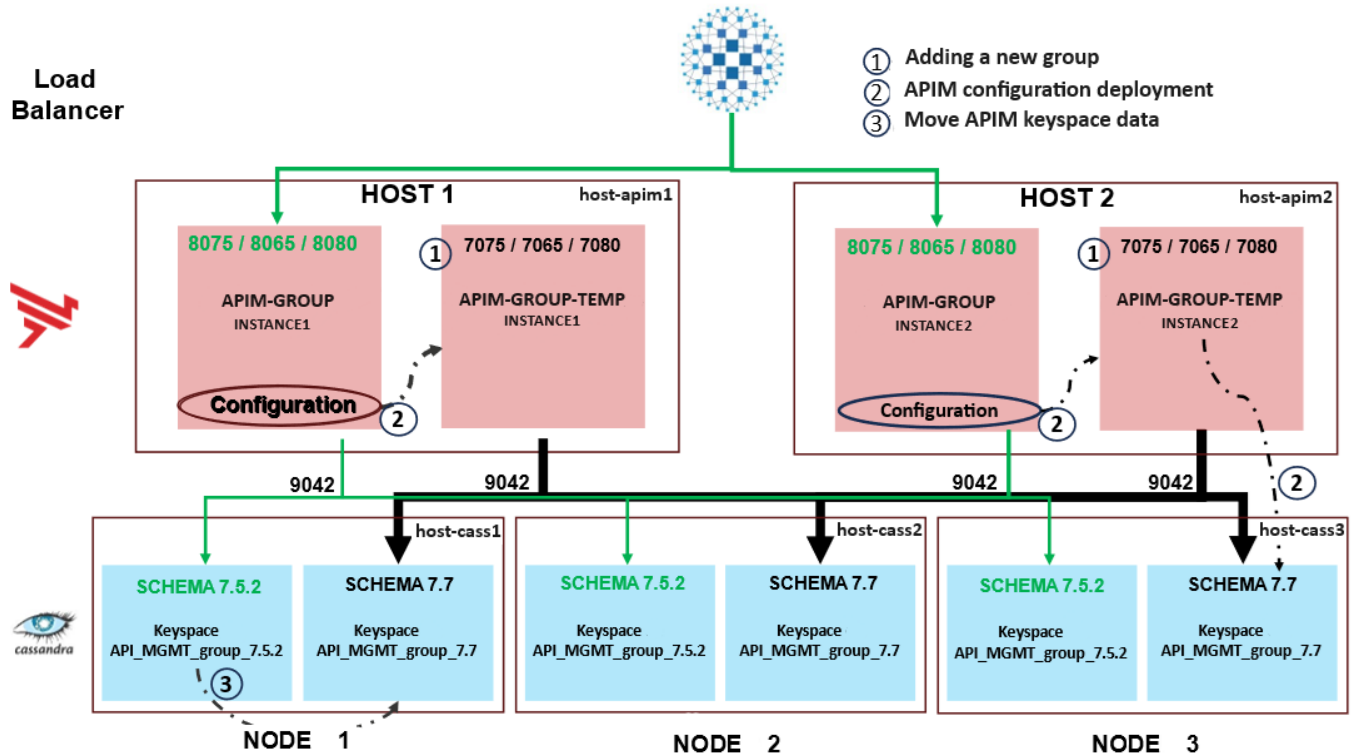
3. Target topology.



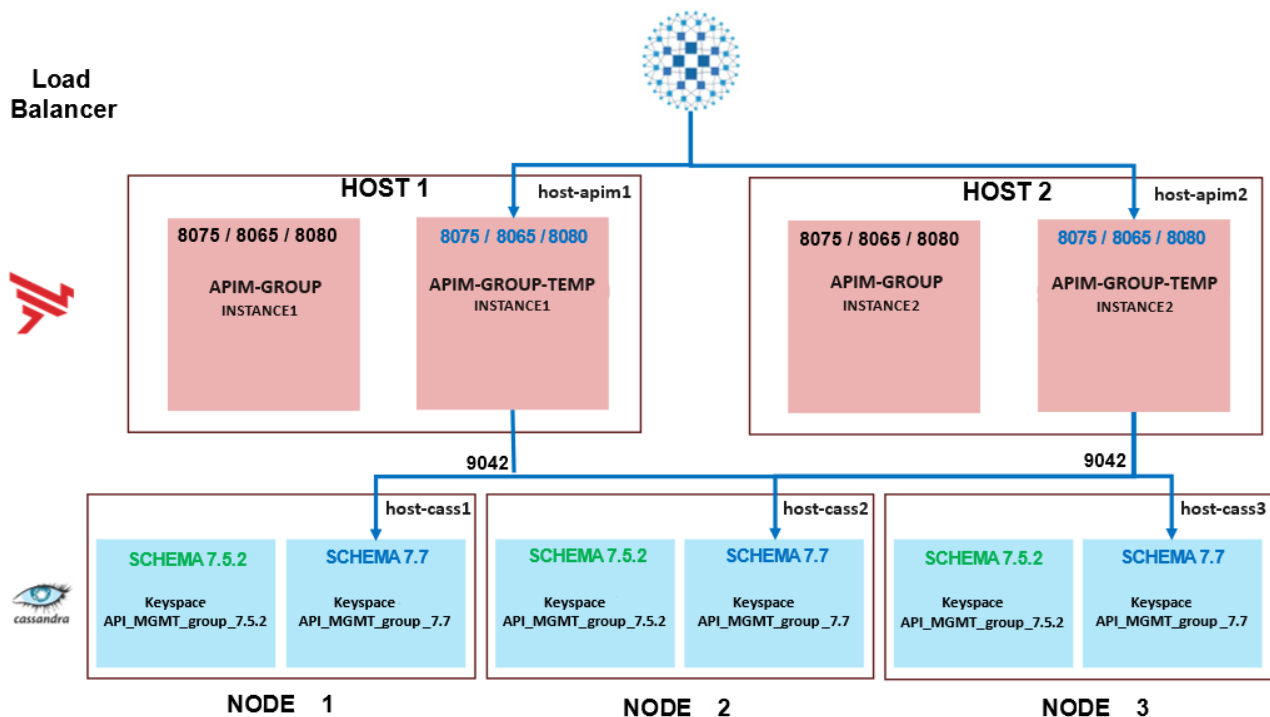
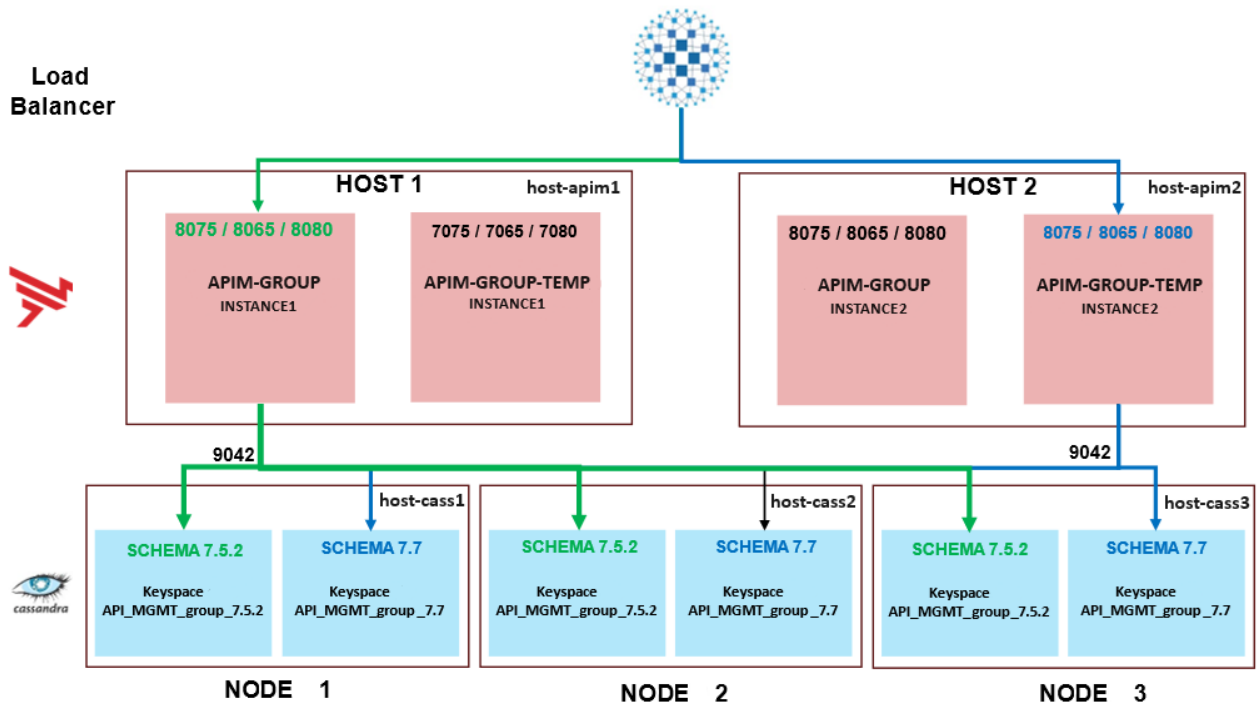
4. Phase 1. Create a new instance group.

Phase 2. Deployment of the Configuration of the new API Manager Group, creation of a compliant Keyspace.

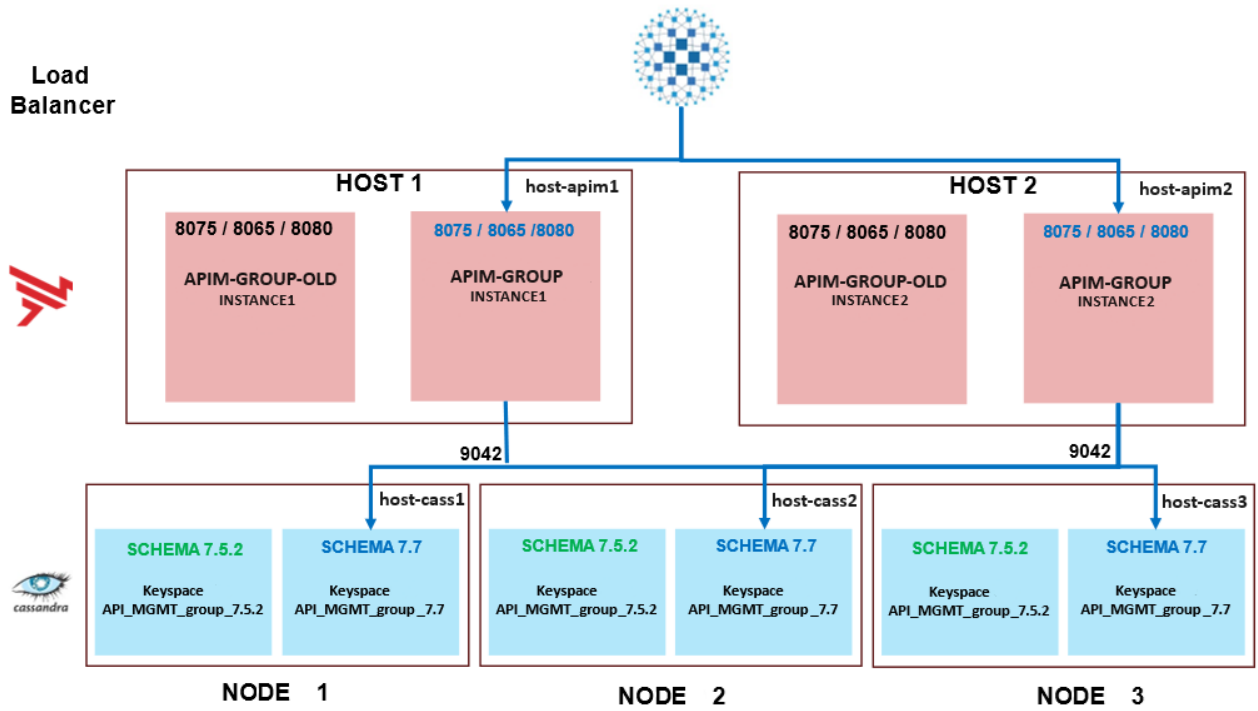
Phase 3. Copying data from the old Keyspace to the new Keyspace.



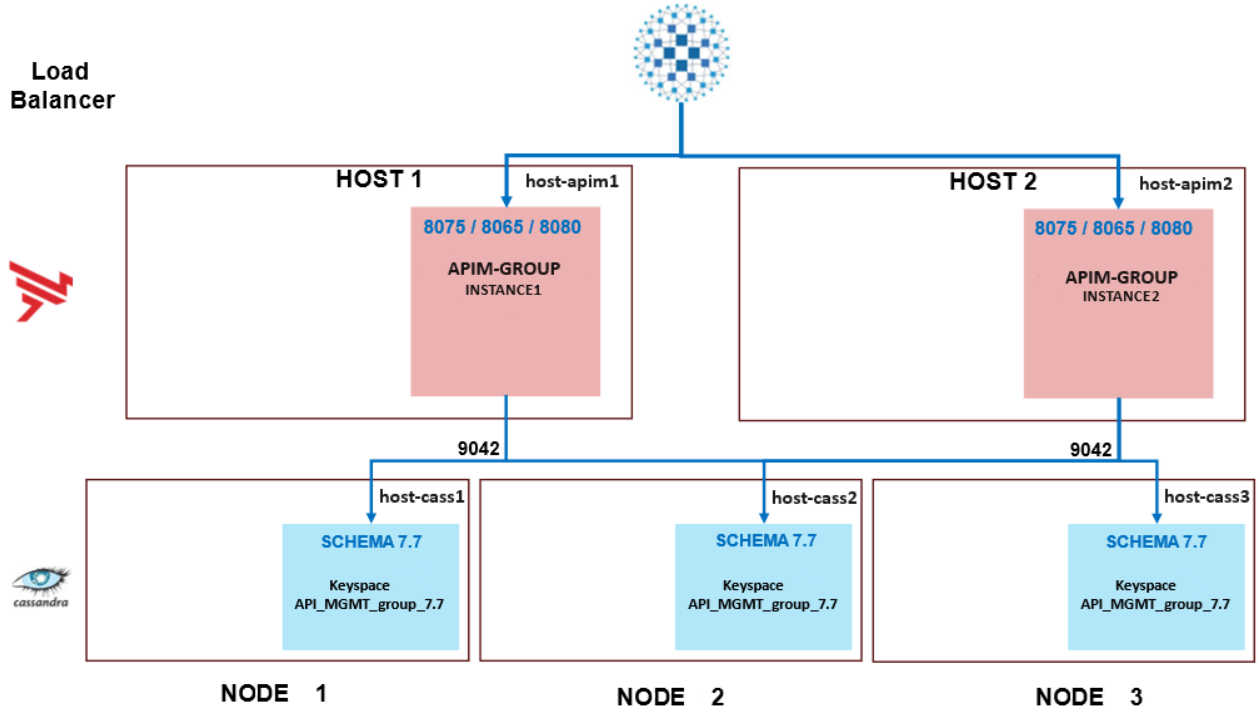
5. Phase 4. Switch API Gateway Instances.



6. Renaming the Group.



7. Deleting the old group and keyspace.



# Procedure.

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## PHASE 1. Create a new group instance

- 1) Create a new API Manager Instance Group for example:

```
> /opt/Axway-7.7/apigateway/posix/bin/managedomain \  
--create_instance \  
--anm_host=host-apim1 \  
--anm_port=8090 \  
--user=admin \  
--password=changeme \  
--name=INSTANCE1 \  
--group=APIM-GROUP-TEMP \  
--host=host-apim1 \  
--instance_management_port=7085 \  
--instance_services_port=7080  
  
> /opt/Axway-7.7/apigateway/posix/bin/managedomain \  
--create_instance \  
--anm_host=host-apim1 \  
--anm_port=8090 \  
--user=admin \  
--password=changeme \  
--name=INSTANCE2 \  
--group=APIM-GROUP_TEMP \  
--host=host-apim2 \  
--instance_management_port=7085 \  
--instance_services_port=7080
```

- 2) For each Instance added, copy the envSettings.props file and any other customized file from the old Instance to the corresponding directory of the new instance.
- 3) Edit these files and replace parameters that could cause a collision with temporary values, typically port numbers. (e.g. 8080,8085,8065,8075,8089)
- 4) Start instances

## PHASE 2. Deployment of the Configuration of the new API Manager Group, creation of a compliant Keyspace.

- 5) Deploy the original APIM Group Configuration to the new Group, using the usual means:

### Policy Studio / managedomain utility / API Gateway Manager.

Deploying the Configuration causes the creation of a Cassandra Keyspace with a schema compatible with the current API Manager version. Obsolete properties inherited from past versions of the schema will be absent in this new Keyspace.

- 6) Check traces of API Gateway Instances (first instance to deploy should create new APIM tables)
- 7) Clear the data from the new keyspace (prevents duplicates of apiadmin user and community org later)

```
> /opt/Axway-7.7/apigateway/posix/bin/kpsadmin --username admin --password changeme --group "APIM-GROUP-TEMP" --name "INSTANCE1" clear
```

## PHASE 3. Copy the data from the old Keyspace to the new Keyspace.

- 8) Download the Datastax dsbulk tool archive to 1 of the Cassandra nodes and extract the contents:

```
> cd /opt/cassandra  
> wget https://downloads.datastax.com/dsbulk/dsbulk.tar.gz  
> tar -xvzf dsbulk.tar.gz  
> ls -l
```

```
total 47644
drwxr-xr-x 2 axway axway 4096 Jan 25 18:34 bin
-rw-r--r-- 1 axway axway 4780 Jul 26 2018 CASSANDRA-14092.txt
-rw-r--r-- 1 axway axway 297840 Jul 26 2018 CHANGES.txt
drwxr-xr-x 3 axway axway 4096 Jan 25 22:00 conf
drwxr-xr-x 5 axway axway 4096 Jan 25 22:03 data
drwxr-xr-x 3 axway axway 4096 Jan 25 14:40 doc
drwxrwxr-x 6 axway axway 4096 Jan 26 10:52 dsbulk-1.11.0
-rw-rw-r-- 1 axway axway 42365550 Aug 15 20:53 dsbulk.tar.gz
drwxr-xr-x 2 axway axway 4096 Jan 25 14:40 interface
drwxr-xr-x 3 axway axway 4096 Jan 25 14:40 javadoc
drwxr-xr-x 5 axway axway 4096 Jan 25 14:40 lib
-rw-r--r-- 1 axway axway 11609 Jul 26 2018 LICENSE.txt
drwxr-xr-x 2 axway axway 4096 Jan 25 22:03 logs
-rw-r--r-- 1 axway axway 84011 Jul 26 2018 NEWS.txt
-rw-r--r-- 1 axway axway 2509 Jul 26 2018 NOTICE.txt
drwxr-xr-x 3 axway axway 4096 Jan 25 14:40 pylib
drwxr-xr-x 4 axway axway 4096 Jan 25 14:40 tools
-rwx----- 1 axway axway 5899408 Jan 25 14:41 uninstall
-rw----- 1 axway axway 61004 Jan 25 14:41 uninstall.dat
```

- 9) Prepare a bash script to use the dsbulk tool.
- Run cqlsh to identify the keyspaces which we want to copy with dsbulk:

```
cqlsh> describe keyspaces
x203ebb22_8d6c_46e5_b456_d0b75b51b04b_group_2 system_auth system_distributed
x203ebb22_8d6c_46e5_b456_d0b75b51b04b_group_3 system system_traces
```

The Keyspaces to identify are those starting with the letter 'x' followed by a Domain identifier then a Group identifier.

- Display the list of Tables in the new Keyspace :

```
cqlsh> use x203ebb22_8d6c_46e5_b456_d0b75b51b04b_group_3;
cqlsh:x203ebb22_8d6c_46e5_b456_d0b75b51b04b_group_3> describe tables;
api_portal_apiorgpolicybindings          counter_table
oauth_authzcodes                          counter_snapshot
api_portal_portalexports                  oauth_authorizations
api_portal_portalapiaccessstore           oauth_clientaccesstokens
api_portal_portalactionqueue              api_server_portalapplicationstore
api_portal_portalidentitystore
api_portal_portalapiquotadetailsstore
api_server_portaloauthresourcesstore
api_server_portaloauthstore
api_portal_portaluserstore
api_portal_portalapimethod
api_portal_portalapistamp
api_portal_portalapistampstore
api_server_portalapistampstore
```

```

api_portal_portaluserstoreldap
kps_schema
api_server_portalexternalclientstore
api_portal_portalorganizationstoreldap
api_portal_portalvirtualizedapimethod
api_portal_portalapi
api_portal_portalvirtualizedapi
api_portal_portalregistrationtoken
oauth_refreshtokens
api_portal_portalorganizationstore
api_portal_apiapppolicybindings
oauth_accesstokens
api_portal_portalremotehost
api_portal_portalconfigstore
oauth_clientrefreshtokens
api_portal_portalapplicationpermissionstore
api_portal_apipolicyparameters
api_portal_portalapiquotaconstraintstore

```

- c. With a text editor, create a bash script. Use the following template, update the Keyspaces names, tables list and tool path :

```

> cat copy-keyspace-data.sh
#!/bin/bash
src_ks="x203ebb22_8d6c_46e5_b456_d0b75b51b04b_group_2"
dst_ks="x203ebb22_8d6c_46e5_b456_d0b75b51b04b_group_3"
tables="api_portal_apiapppolicybindings api_portal_apiorgpolicybindings api_portal_apipolicyparameters api_portal_portalactionqueue
api_portal_portalapi api_portal_portalapiaccessstore api_portal_portalapimethod api_portal_portalapiquotaconstraintstore
api_portal_portalapiquotadetailsstore api_portal_portalapiquotastore api_portal_portalapplicationpermissionstore
api_portal_portalconfigstore api_portal_portalexports api_portal_portalidentitystore api_portal_portalorganizationstore
api_portal_portalorganizationstoreldap api_portal_portalregistrationtoken api_portal_portalremotehost api_portal_portaltimestamp
api_portal_portaluserstore api_portal_portaluserstoreldap api_portal_portalvirtualizedapi api_portal_portalvirtualizedapimethod
api_server_portalapikeystore api_server_portalapplicationstore api_server_portalexternalclientstore api_server_portaloauthresourcesstore
api_server_portaloauthstore counter_snapshot counter_table kps_schema oauth_accesstokens oauth_authorizations oauth_authzcodes
oauth_clientaccesstokens oauth_clientrefreshtokens oauth_refreshtokens"
for i in $tables; do
  /opt/Axway/cassandra/dsbulk-1.11.0/bin/dsbulk unload --connector.csv.maxCharsPerColumn -1 --connector.csv.url $i.csv -k $src_ks -t $i
  /opt/Axway/cassandra/dsbulk-1.11.0/bin/dsbulk load --connector.csv.maxCharsPerColumn -1 --connector.csv.url $i.csv -k $dst_ks -t $i
  rm -rf $i.csv
done
exit

```

- d. Update the Cassandra driver configuration file `/opt/cassandra/dsbulk-1.11.0/conf/driver.conf`:

```

datastax-java-driver {
  # Example to set contact points:
  basic.contact-points = [ "host-cass1:9042" , "host-cass2:9042", "host-cass3:9042" ]
}

```

e. Execute the script:

```

> /opt/cassandra/copy-keyspace-data.sh
total | failed | rows/s | p50ms | p99ms | p999ms
  0 |   0 |   0 | 0.00 | 0.00 | 0.00
Operation UNLOAD_20240126-145228-392320 completed successfully in less than one second.
Checkpoints for the current operation were written to checkpoint.csv.
To resume the current operation, re-run it with the same settings, and add the following command line flag:
--dsbulk.log.checkpoint.file=/opt/Axway-7.7/cassandra/dsbulk-1.11.0/logs/UNLOAD_20240126-145228-392320/checkpoint.csv
Directory /opt/Axway-7.7/cassandra/dsbulk-1.11.0/api_portal_apiappppolicybindings.csv has no readable files.
.
.
.

```

- 10) Restart instances of group APIM-GROUP-TEMP (makes sure the catalog is refreshed)
- 11) **Check the result ideally by testing the new API Manager in APIM-GROUP-TEMP on port 7075.**

#### PHASE 4. Switching API Gateway Instances.

- 12) Stop Instance **INSTANCE1** of Group **APIM-GROUP-TEMP**
- 13) Edit on both nodes **envSettings.props** and any other configuration files modified in step 2), return the original values. (this only takes effect after a restart later)
- 14) Set management ports of host 1 instances: original group instances will use a new port; new group instances will use the original port.

```

> /opt/Axway-7.7/apigateway/posix/bin/managedomain --edit_instance --anm_host=host-apim1 --anm_port=8090 --user=admin --password=changeme --name=INSTANCE1 --group=APIM-GROUP --host=host-apim1 --newport=6085
> /opt/Axway-7.7/apigateway/posix/bin/managedomain --edit_instance --anm_host=host-apim1 --anm_port=8090 --user=admin --password=changeme --name=INSTANCE1 --group=APIM-GROUP-TEMP --host=host-apim1 --newport=8085

```

- 15) Stop Instance **INSTANCE1** of Group **APIM-GROUP**.
- 16) Start Instance **INSTANCE1** of Group **APIM-GROUP-TEMP**.
- 17) Observe the general behaviour of API Manager.
- 18) Stop Instance **INSTANCE2** of Group **APIM-GROUP-TEMP**.
- 19) Set management ports of host 2 instances: original group instances will use a new port; new group instances will use original port.

```

> /opt/Axway-7.7/apigateway/posix/bin/managedomain --edit_instance --anm_host=host-apim1 --anm_port=8090 --user=admin --password=changeme --name=INSTANCE2 --group=APIM-GROUP --host=host-apim2 --newport=6085

```

```
> /opt/Axway-7.7/apigateway/posix/bin/managedomain --edit_instance --anm_host=host-apim1 --anm_port=8090 --user=admin --password=changeme --name=INSTANCE2 --group=APIM-GROUP-TEMP --host=host-apim2 --newport=8085
```

20) Stop Instance **INSTANCE2** of Group **APIM-GROUP**.

21) Start Instance **INSTANCE2** of Group **APIM-GROUP-TEMP**.

22) Observe the general behaviour of API Manager.

**POST OPERATION.** Renaming Groups, delete old group and drop old keyspace (no longer used)

23) Rename the Group **APIM-GROUP** to **APIM-GROUP-OLD**.

```
> /opt/Axway-7.7/apigateway/posix/bin/managedomain --edit_group --group APIM-GROUP --newname APIM-GROUP-OLD
```

24) Rename the Group **APIM-GROUP-TEMP** to **APIM-GROUP**.

```
> /opt/Axway-7.7/apigateway/posix/bin/managedomain --edit_group --group APIM-GROUP-TEMP --newname APIM-GROUP
```

25) Delete the Group **APIM-GROUP-OLD**.

```
> /opt/Axway-7.7/apigateway/posix/bin/managedomain --delete_group --group APIM-GROUP-OLD
```

26) Delete the old keyspace, when the new keyspace is fully tested (auto snapshot is on by default)

```
cqlsh> drop keyspaces x203ebb22_8d6c_46e5_b456_d0b75b51b04b_group_2;
```

27) The auto snapshot can be removed but below note command removes all snapshots from all keyspaces

```
> nodetool clearsnapshot
```

28) Finally, the directories left behind can be removed on each node for the old keyspace. These will be from :-  
data/data/ x203ebb22\_8d6c\_46e5\_b456\_d0b75b51b04b\_group\_2